CLAIMS

What is claimed is:

1. A magnetic torque transfer device comprising:

an input member;

at least one input gear rotatably driven by the input member, the at least one input gear including a first plurality of gear teeth;

an output member;

at least one output gear rotatably driven by the output member, the at least one output gear including a second plurality of gear teeth, the second plurality of gear teeth meshingly engaged with the first plurality of gear teeth; and

a magneto rheological fluid disposed between at least some of the meshing first and second pluralities of gear teeth;

wherein the input member is normally permitted to rotate relative to the output member and is coupled for rotation with the output member upon activation of the magneto rheological fluid.

2. The magnetic torque transfer device of claim 1, wherein the magneto rheological fluid operates in a compression mode between the at least some of the meshing first and second pluralities of gear teeth upon activation.

3. The magnetic torque transfer device of claim 1, wherein the at least one input gear includes a plurality of pinion gears.

4. The magnetic torque transfer device of claim 1, further comprising means for activating the magneto rheological fluid.

5. The magnetic torque transfer device of claim 1, wherein the means for activating comprises at least one electrical coil.

6. The magnetic torque transfer device of claim 1, wherein the device is a clutch;

7. The magnetic torque transfer device of claim 1, wherein the device is a brake.

8. A torque transfer device comprising:

an input assembly;

an output assembly; and

a magneto rheological fluid disposed between the input assembly and the output assembly, the magneto rheological fluid operative in

a first state for permitting relative rotation between the input and output assemblies and a second state for coupling the input and output assemblies for common rotation, the MRF operating in a compression made in the second state.

9. The torque transfer device of claim 8, wherein the input assembly includes a first gear and the output assembly includes a second gear, the first gear meshingly engaged with the second gear.

10. The torque transfer device of claim 9, wherein the MRF is disposed between the first and second gears.

11. The torque transfer device of claim 8, further comprising means for activating the MRF.

12. The torque transfer device of claim 11, wherein the means for activating comprises at least one electrical coil.

13. The torque transfer device of claim 8, wherein the device is a clutch.

14. The torque transfer device of claim 8, wherein the device is a brake.

15. A method of transferring torque, the method comprising the steps of:

providing a device having an input assembly coupled for relative rotation to an output assembly, the device having a magneto rheological fluid (MRF) disposed between the input and output assemblies; and

activating the MRF to couple the input shaft for common rotation with the output shaft in a compression mode.